

# PATENT SPECIFICATION 614681



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## PROVISIONAL SPECIFICATION

### Improvements in and relating to Electric Junction and Fuse Boxes Embodying Switches

We, ARTHUR WILLIAM MARSHALL HARTLEY, JOHN ROBERT JONES and ROBERT SIDNEY AKERS, all British Subjects, and all of 17, St. John's Hill, Shrewsbury, Shropshire, do hereby declare the nature of this invention to be as follows:—

It is well known to construct electrical junction boxes and fuse boxes embodying main switches, the construction being such that it is only possible to open the box to gain access to the interior, after an external switch control has first been operated to open the switch, and return of the switch to the "On" position is prevented until closure of the box has been effected.

The object of the present invention is an improved arrangement whereby the necessity for the separate operation of the switch and box closure is eliminated.

In accordance with the invention an electrical junction or fuse box is provided having a movable lid or cover, an enclosed "On"—"Off" switch mounted within the box and means movable by or with the movable lid or cover and adapted to move the control element of the switch into the "Off" and "On" positions respectively as the lid or cover is moved to open and close the box, and to prevent movement of said control element and switch from the "Off" to the "On" position whilst the box remains open.

The switch may be of the snap tumbler type so that after a movement of the control element thereof of limited extent the switch moves to the full "On" or full "Off" position with snap action.

According to one embodiment as applied to a fuse box suitable for domestic and like electrical wiring installations, the box body may be a sheet metal structure of cubic rectangular form having the usual terminal posts and fuse holders mounted therein.

A lid or cover plate is hinged mounted

at the free edge of one of the sides of the box, said lid being preferably flanged on the three free edges to overlap the edges of the box when closed, a spring ball or like catch being provided to retain it in the closed position and a ring handle or the like to facilitate opening.

The wall on which the lid is hinged is centrally apertured and a self-contained enclosed "On"—"Off" switch of the snap tumbler type is mounted in said aperture on a fixed plate or other suitable fixed support. The switch control element is in the form of a lever the free end of which projects through a slot in the outer face of the switch casing and the switch is mounted with the axis of movement of the control element substantially parallel to the hinge line of the lid.

The portion of the switch extending outside the wall of the box may be enclosed in a small auxiliary sheet metal box affixed to the outside of the main box and itself provided with a removable cover permitting access to the mains connections to the switch, said cover being preferably secured in a semi-permanent manner e.g. by bolts or screws.

On the hinged edge of the lid is fixed a lug projecting in the plane of but away from the lid and on the lug is fixed a projection extending at right angles thereto and into the path of movement of the control element of the switch, the arrangement being such that during the early part of the opening movement of the lid the projection engages the control element to move it and cause early opening of the switch. The end of the switch control element in the "Off" position is away from the arc of movement of the projection.

On the projection is pivotally mounted a channel section member the channel being closed at one end and the pivot being formed by a pin passing through the channel walls and the projection.

[Price 2/ ]

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The channel section member is spring loaded for movement about its pivot in one direction relative to the projection i.e. in the direction to bring the closed end 5 towards the switch control element, the movement being limited by stops on the projection engaged by the channel walls. The arrangement is such that as the lid is closed the closed end of the channel section 10 member engages behind the end of the switch control element to move the latter towards the "On" position until the position is reached where the switch snaps over. The dimensions are such that the 15 closed end of the channel is so spaced from the control element that during movement to the switch "Off" position as the lid is opened, it does not obstruct the movement thereof into that position as 20 the lid is opened, whilst movement of the switch to the "On" position by engagement of the channel section member with the control element during closing movement of the lid is delayed until the lid 25 is almost fully closed.

During the closing movement the channel section member is permitted to

rock against its loading spring relative to the body of the switch whilst maintaining contact with the control element, as may 30 be necessitated by the proximity of the switch casing but in the fully closed position is returned by the spring to its fully rocked position behind and even in engagement with the end of the control 35 element.

The lid is preferably provided with one or more folding stays to retain the lid horizontal when fully open so that the lid 40 in this position serves as a convenient shelf for tools, fuse holders and so on during assembly, repair or replacement operations.

The lid is also provided with one or more sets of clips for the retention of one 45 or more wired fuse holders so that rapid replacement of broken fuses may be effected, the box closed and light switched on to facilitate rewiring of the removed fuse holders. 50

Dated this 19th day of July, 1946.

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## COMPLETE SPECIFICATION

### Improvements in and relating to Electric Junction and Fuse Boxes Embodying Switches

We, ARTHUR WILLIAM MARSHALL HARTLEY, JOHN ROBERT JONES and ROBERT SIDNEY AKERS, all British Subjects, and all of 17, St. John's Hill, 55 Shrewsbury, Shropshire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following 60 statement:—

It is well known to construct electrical junction boxes and fuse boxes embodying main switches, the construction being such that it is only possible to open the 65 box to gain access to the interior, after an external switch control has first been operated to open the switch, and return of the switch to the "On" position is prevented until closure of the box has been 70 effected.

Fuse boxes are also known in which a control switch disposed within the box is arranged to open and close as the cover of the box is opened or closed, the switch 75 being open and held open whilst the box cover is in the open position and closed by the movement of the cover to the closed position.

In accordance with the present invention an electrical junction or fuse box is 80 provided having a movable lid or cover, an enclosed "On"—"Off" switch

mounted within the box and means movable by the movable lid or cover and adapted to move the control element of the 85 switch into the "Off" and "On" positions respectively as the lid or cover is moved to open and close the box, and to prevent movement of said control element and switch from the "Off" to the "On" 90 position whilst the box remains open.

The switch may be of the snap tumbler type so that after a movement of the control element thereof of limited extent the switch moves to the full "On" or 95 full "Off" position with snap action.

An embodiment of the invention as applied to a fuse box suitable for domestic and like electrical wiring installations is illustrated by way of example in the 100 accompanying drawings, in which:—

Figure 1 is a diagrammatic perspective view of a part of a junction or fuse box shown with the cover in the open position, all parts such as terminals, fuses and the 105 like unessential to an understanding of the invention being omitted.

Figures 2, 3 and 4 are further perspective views of a part of Figure 1 showing the position of parts at various 110 stages in the operation of opening or closing the box.

Figure 5 is a perspective view showing operative parts of the construction of

Figures 1—4 in greater detail.

Referring to the drawings (Figures 1—4), a box 1, usually of sheet metal, is provided with an aperture 2 in the front wall and a lid or cover 3 hinged at its lower edge to the lower edge of the aperture 2 so as to be movable between for example a horizontal open position as shown in Figure 1 and a closed position as indicated in Figure 4 where it closes the aperture 2.

Any convenient form of catch such as a spring ball (not shown) may be provided to retain the cover 3 in the closing position and a ring handle or the like provided to facilitate opening.

The usual terminal posts, fuse holders and fuses or the like (not shown) are mounted within the box in normal manner so as to be accessible from the exterior when the cover 3 is in the open position.

The whole assembly is controlled by means of an enclosed "On"—"Off" switch 4 of the snap-tumbler type mounted fixedly in position on the lower wall of the box 1 or upon a suitable fixed support provided therein. The control element of the switch 4 is in the form of a lever 5 the free end of which projects through a slot 6 in the outer face 7 of the switch casing and the switch 4 is mounted with the axis of movement of the control element 5 substantially parallel to the hinge line of the lid or cover 3.

At the hinged edge of the lid or cover 3 is fixed a stiff metal strip 8 projecting in the plane of but away from the lid 3 and into the box 1 and on the end of the metal strip 8 is fixed a projection in the form of a block 9 the end of which is bevelled at the side away from the cover 3, said block 9 extending at right angles to the strip and into the path of movement of the end of the control element 5 of the switch 4, the arrangement being such that during the early part of an opening movement of the lid or cover 3, i.e. downwards from the position shown in Figure 4, the end of the block 9 engages the control element 5 to move it upwards and cause early opening of the switch 4. In the full open position of the cover 3 the bevel surface of the block 9 lies close to or against the switch control element 5 now in the "Off" position and serves to prevent return of the control element to the switch "On" position whilst the lid or cover 3 remains open.

On the strip 8 at the front of the block 9 is pivotally mounted a hook element formed by a channel section member 10 with the channel closed at one end by a part 11, the pivot being formed in the embodiment illustrated by a pin 12 passing through the channel walls 13 and

lugs 14 on the strip 8 close to the block 9.

The channel section member 10 is biased by a spring 15 for movement about the pivot pin 12 in one direction relative to the block 9, i.e. in the direction to urge the free end of part 11 towards and over the switch control element 5. The arrangement is such that as the lid or cover 3 is moved from the open position in Figure 1 towards the closed position of Figure 4, the part 11 engages over the end of the switch control element 5 so that the latter is moved towards the "On" position until the position is reached where the switch 4 snaps "On", the part 11 of member 10 remaining, throughout this movement, over the control element 5. The dimensions are such however that the part 11 of the channel section member 10 is spaced from the control element 5 in the "On" position of the switch so that during movement to the switch "Off" position as the cover 3 is opened, it offers no obstruction to the movement of said control element into the "Off" position during the early part of that opening movement, whilst movement of the switch to the "On" position by engagement of the channel section member 10 with the control element 5 during closing movement of the cover 3 is delayed until the cover is almost fully closed.

During the closing movement, the channel section member 10 is permitted to rock against its loading spring 15 relative to the body of the switch 4 whilst maintaining contact with the control element 5 during the time required to move it to the point where it snaps the switch "On", but in the fully closed position the member 10 is held by the spring 15 over the end of the control element.

The cover 3 is preferably provided with one or more folding stays 16 (Figure 1) to retain the cover horizontal when fully open so that the cover in this position serves as a convenient shelf for tools, fuse holders and so on during assembly, repair or replacement operations.

The cover may also be provided with one or more sets of clips (not shown) for the retention of one or more wired fuse holders so that rapid replacement of broken fuses may be effected, and the box closed and light switched on to facilitate rewiring of removed fuse holders.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An electrical junction or fuse box having a movable lid or cover, an enclosed "On"—"Off" switch mounted within the box and means movable by the

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movable lid or cover and adapted to move the control element of the switch into the "Off" and "On" positions respectively as the lid or cover is moved to open and close the box and to prevent movement of said control element and switch from the "Off" to the "On" position whilst the box remains open.

2. An electrical junction or fuse box as claimed in Claim 1 wherein the switch is controlled by means arranged to pivot about an axis generally parallel to the hinge line of the lid or cover characterised in that said means comprises a part rigidly connected with the cover and extending into the box and bearing on the one hand a projection adapted to engage and move the switch control element towards the switch "Off" position as the cover is opened and to lie in the path of the switch control element whilst the cover remains

open and on the other hand a pivotally mounted hook element adapted to engage and move the switch control element towards the switch "On" position as the cover is moved towards the closed position.

3. An electrical junction or fuse box as claimed in Claim 2 wherein the projection is in the form of a block fixedly mounted on the part extending into the box and the hook element is formed by a pivoted channel section member closed at one end and biased in one direction about its pivot to urge the closed end towards the switch.

4. The improved electrical junction or fuse box substantially as described with reference to the accompanying drawings.

Dated the 23rd day of July, 1947.

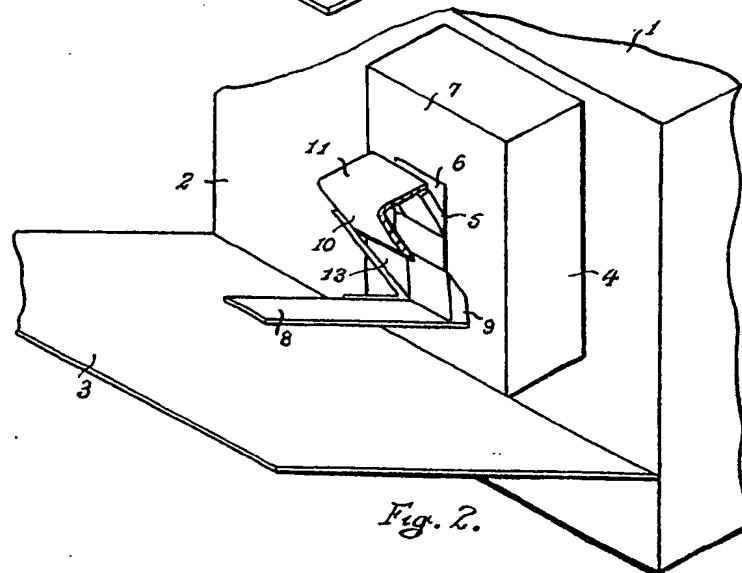
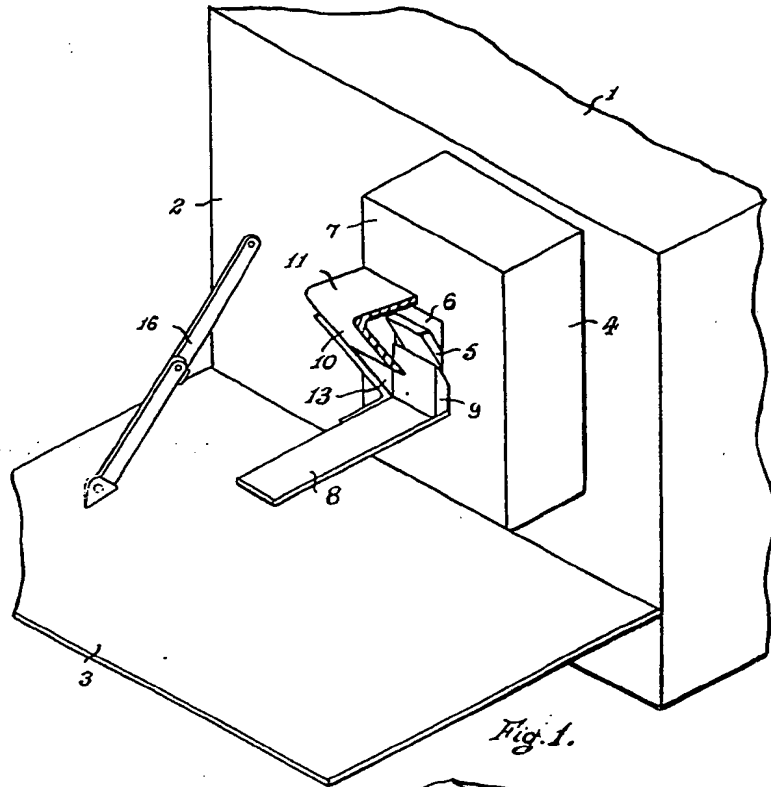
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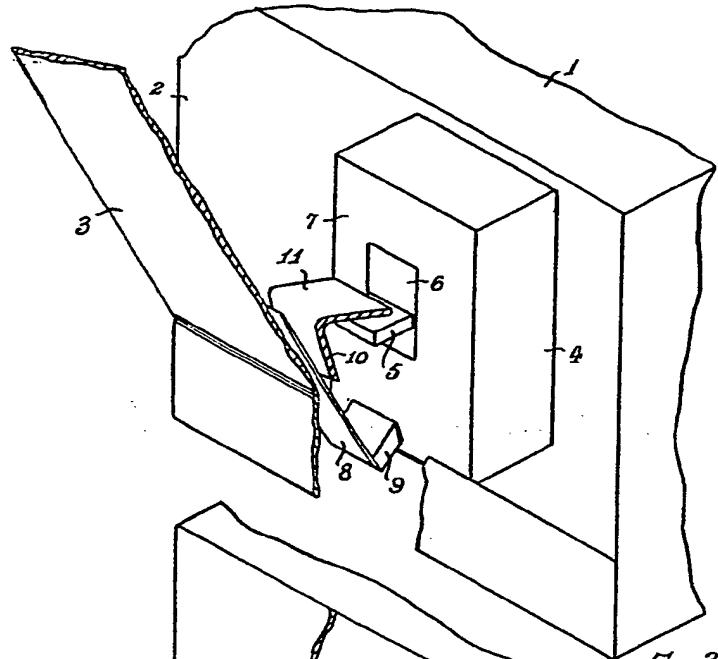


Fig. 3.

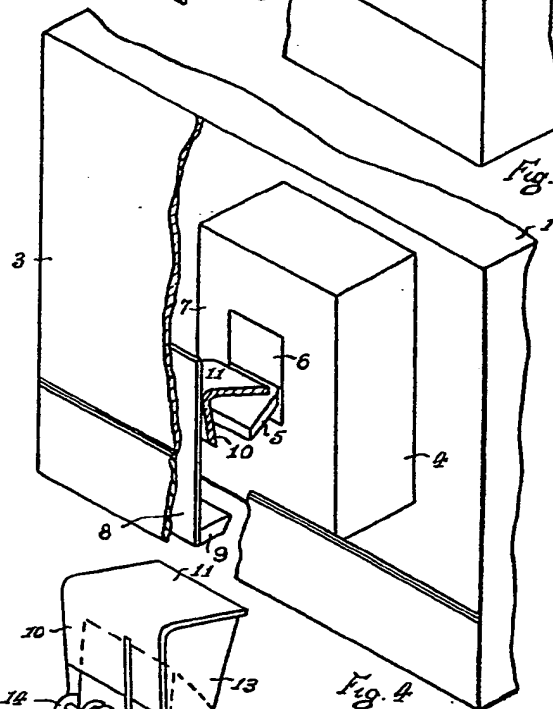


Fig. 4.

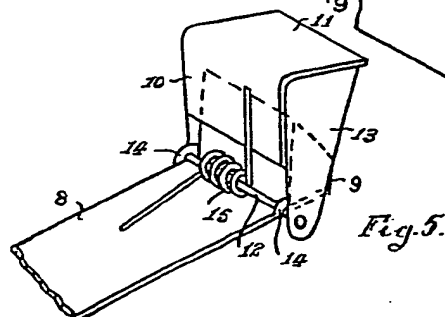
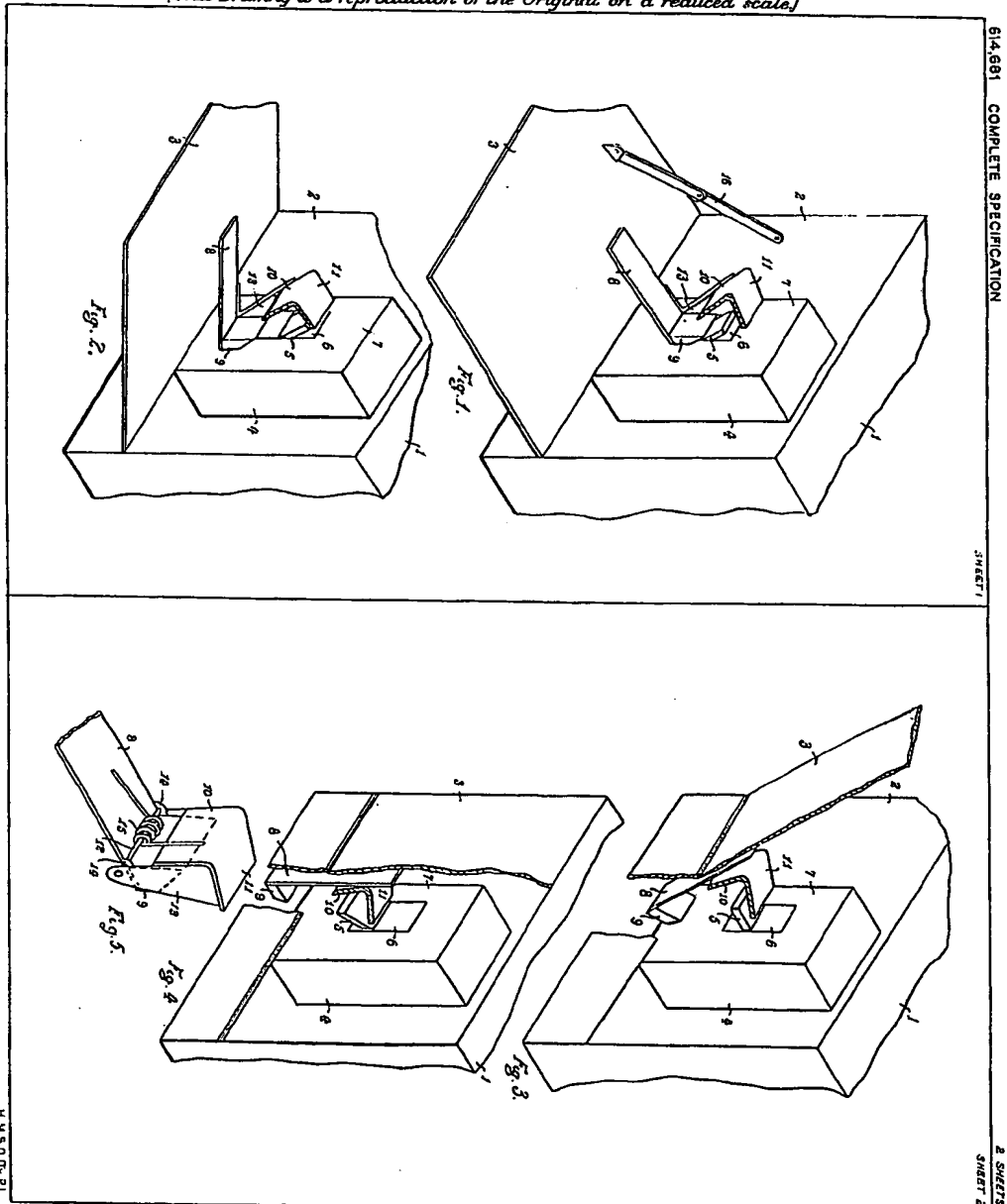


Fig. 5.

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